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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/800,227	03/12/2004	Mark S. Kleefisch	37,275-00	8560

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BP America Inc.
Docket Clerk, BP Legal, M.C. 5East
4101 Winfield Road
Warrenville, IL 60555

EXAMINER

HEWITT, JAMES M

ART UNIT	PAPER NUMBER
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3679

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/800,227	Applicant(s) KLEEFISCH ET AL.	
	Examiner JAMES M. HEWITT	Art Unit 3679	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 13-17 and 26-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13-17, 26, 27 and 29-33 is/are rejected.
- 7) ☒ Claim(s) 28 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(g),(o). The following does not find proper antecedent basis in the Detailed Description of the specification: a girdle of a *resilient* metallic material.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 7-8, 10-11 and 14 are rejected under 35 U.S.C. 102(e) as being anticipated by White et al (US 6,547,286).

White et al disclose a joint assembly for joining a ceramic membrane to a tube sheet used in supporting the ceramic membrane within a reactor. The joint (1) connects a tubular ceramic element (2) to a tubesheet (3) to allow fluids to flow between side “A” of the tubesheet and the interior of the tubular ceramic membrane tube while isolating side “A” of the tubesheet from an opposite side “B”. As shown in FIG. 3, the

Art Unit: 3679

ceramic element includes a closed end and an opposite tapered end that is sealed via a sealing material to a tapered inner surface of the section (22) of seal housing (10). The sealing material can be a brazing material which is effected by known brazing techniques. As should be understood, brazing material is a resilient metallic material such as silver, tin, zinc or copper capable of undergoing plastic deformation without rupture. The seal housing is metallic and can be formed of suitable high temperature alloys such as HAYNES 230 alloy, HAYNES 214 or INCOLOY 800HT.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 4-6, 9 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al (US 6,547,286) in view of the article "FABRICATION OF CERAMIC-MEMBRANE TUBES FOR DIRECT CONVERSION OF NATURAL GAS" by Balachandran et al, published at the 1992 International Gas Research Conference.

White et al fail to explicitly teach that the ceramic membrane includes a ceramic material comprising a crystalline mixed metal oxide selected from a class of materials that have an X-ray identifiable crystalline structure based upon the structure of the mineral perovskite, and which exhibit at operating temperatures, electron conductivity, oxygen ion conductivity, and the ability to separate oxygen from a gaseous mixture

Art Unit: 3679

containing oxygen and one or more components by means of the conductivities.

Balachandran et al teach that such a ceramic material is useful in oxygen permeable membranes to produce value-added products. In view of Balachandran et al's teaching and since it has been held to be within the general skill of a worker to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, it would have been obvious to one having ordinary skill at the time the invention was made to employ a ceramic membrane includes a ceramic material comprising a crystalline mixed metal oxide selected from a class of materials that have an X-ray identifiable crystalline structure based upon the structure of the mineral perovskite, and which exhibit at operating temperatures, electron conductivity, oxygen ion conductivity, and the ability to separate oxygen from a gaseous mixture containing oxygen and one or more components by means of the conductivities in White et al.

Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over White et al (US 6,547,286).

White et al discloses that the sealing material may be a brazing material. A variety of alloys of metals, including silver, tin, zinc and copper and others are well known and commonly used as filler for brazing processes. As such, it would have been obvious to one having ordinary skill in the art at the time the invention was made to employ one or more of silver, tin, zinc and copper in the brazing material in White et al.

Claims 26-27, 30 and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al (US 6,547,286) in view of Ueda et al (US 5,240,769).

As described in the above rejections of claims 1-3, 7-8, 10-11 and 14, White et al teaches all of the limitations of claims 26-27, 30 and 32 except that the girdle comprises a composite of graphite and a metallic material. Ueda et al teaches a packing material used for sealing two members, the packing material comprising a graphite sheet with metal fibers interwoven (see claim 4) for example. Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify White et al to include a graphite sheet packing with metal fibers in order to enhance the strength of the packing.

Claims 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over White et al (US 6,547,286) in view of Ueda et al (US 5,240,769) as applied to claim 26 above, and further in view of the article "FABRICATION OF CERAMIC-MEMBRANE TUBES FOR DIRECT CONVERSION OF NATURAL GAS" by Balachandran et al, published at the 1992 International Gas Research Conference.

As described in the above rejection of claim 26, White et al/Ueda et al teach all the limitations of claims 29-31 except that the ceramic membrane includes a ceramic material comprising a crystalline mixed metal oxide selected from a class of materials that have an X-ray identifiable crystalline structure based upon the structure of the mineral perovskite, and which exhibit at operating temperatures, electron conductivity, oxygen ion conductivity, and the ability to separate oxygen from a gaseous mixture

Art Unit: 3679

containing oxygen and one or more components by means of the conductivities.

Balachandran et al teach that such a ceramic material is useful in oxygen permeable membranes to produce value-added products. In view of Balachandran et al's teaching and since it has been held to be within the general skill of a worker to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice, it would have been obvious to one having ordinary skill at the time the invention was made to employ a ceramic membrane includes a ceramic material comprising a crystalline mixed metal oxide selected from a class of materials that have an X-ray identifiable crystalline structure based upon the structure of the mineral perovskite, and which exhibit at operating temperatures, electron conductivity, oxygen ion conductivity, and the ability to separate oxygen from a gaseous mixture containing oxygen and one or more components by means of the conductivities in White et al.

Allowable Subject Matter

Claim 28 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed 10/21/08 have been fully considered but they are not persuasive.

Applicant argues that White et al do not teach “a girdle of a resilient metallic material capable of undergoing plastic deformation without rupture” as claimed in claim 1 and as similarly claimed in claims 7, 11 and 26. Applicant asserts “Brazing does not use a member, such as a girdle member as claimed, which is of a resilient material capable of plastic deformation upon being subjected to a mechanical force, i.e., differential pressure across the joint being formed.” and “The melting of solder or brazing material into a liquid form is not plastic deformation without rupture when a differential pressure is applied to the member as is claimed in the present invention. The solder or brazing material after melting is also clearly not in the shape it was in prior to brazing, and thus, is not even close to being a resilient material.” In response, in White et al, if the sealing material were brazing material, it would constitute a resilient metallic material such as silver, tin, zinc or copper capable of undergoing plastic deformation without rupture. As is clear from White et al, the brazing material would be an annular metal ring (girdle) placed between the outer tapered surface of the tubesheet and the inner tapered surface of the housing. Heat would be applied to effect the joint. And a given differential pressure across the joint would provide compressive force upon the girdle through the mating surfaces.

Applicant argues "Brazing does not use a solid member, such as a girdle as claimed, which is of a resilient material capable of plastic deformation upon being subjected to differential pressure across the joint being formed. The melting of solder or brazing material into a liquid form is not plastic deformation without rupture under differential pressure as claimed in the present invention." As explained above, brazing does employ a solid member such as an annulus, which is of a resilient material capable of plastic deformation.

Regarding the rejection of claims 26-27, 30 and 32-33 under 103(a) as being unpatentable over White et al in view of Ueda et al, Applicant asserts " It appears that the teachings of White et al (high temperature brazing) are inconsistent with the teachings of Ueda et al. as some materials employed by Ueda et al. would be unsuitable for a high temperature brazing-type process as taught by White et al." In response, White et al's girdle (28) is not necessarily brazed. From col. 5, ll. 50-53 in White et al, "For instance sealing material **28** could be a conical gasket fabricated from either a graphite sheet, a ceramic fiber mat or felt, or a combination of graphite and ceramic fiber."

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES M. HEWITT whose telephone number is (571)272-7084. The examiner can normally be reached on M-F, 930am-600pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Stodola can be reached on 571-272-7087. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3679

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James M Hewitt/
Primary Examiner, Art Unit 3679